Management of Change and Pre-startup Safety Review

Management of Change Purpose

Establish a formal written mechanism for ensuring that changes do not degrade the safety that was purposefully designed into the original process operation.

Management of Change
Chemical Changes

- Material quality
- Product quality

Technology Changes

- Increase in chemical inventory
- Equipment unavailability
- Change in operating conditions outside of operating limits

Management of Change
Equipment Changes

- Staffing/reorganization
- Decommissioning equipment
- Substitution of materials
  - Piping, gasket and seal with diff material
  - Vessel w/ one of diff pressure rating or size
  - Control valve with diff size
  - Mineral oil lubrication system to synthetic oil lubrication
- New installation
  - Bypass around equipment
  - Parallel equipment (standby pump)
  - Field mounted local pump control panel w/ programmable logic controller
  - Compressor, evaporative condenser

Management of Change Procedure Changes

- Standard operating procedures
- Preventative maintenance
- Inspection and testing
- Emergency operating
- Training
- Company policies

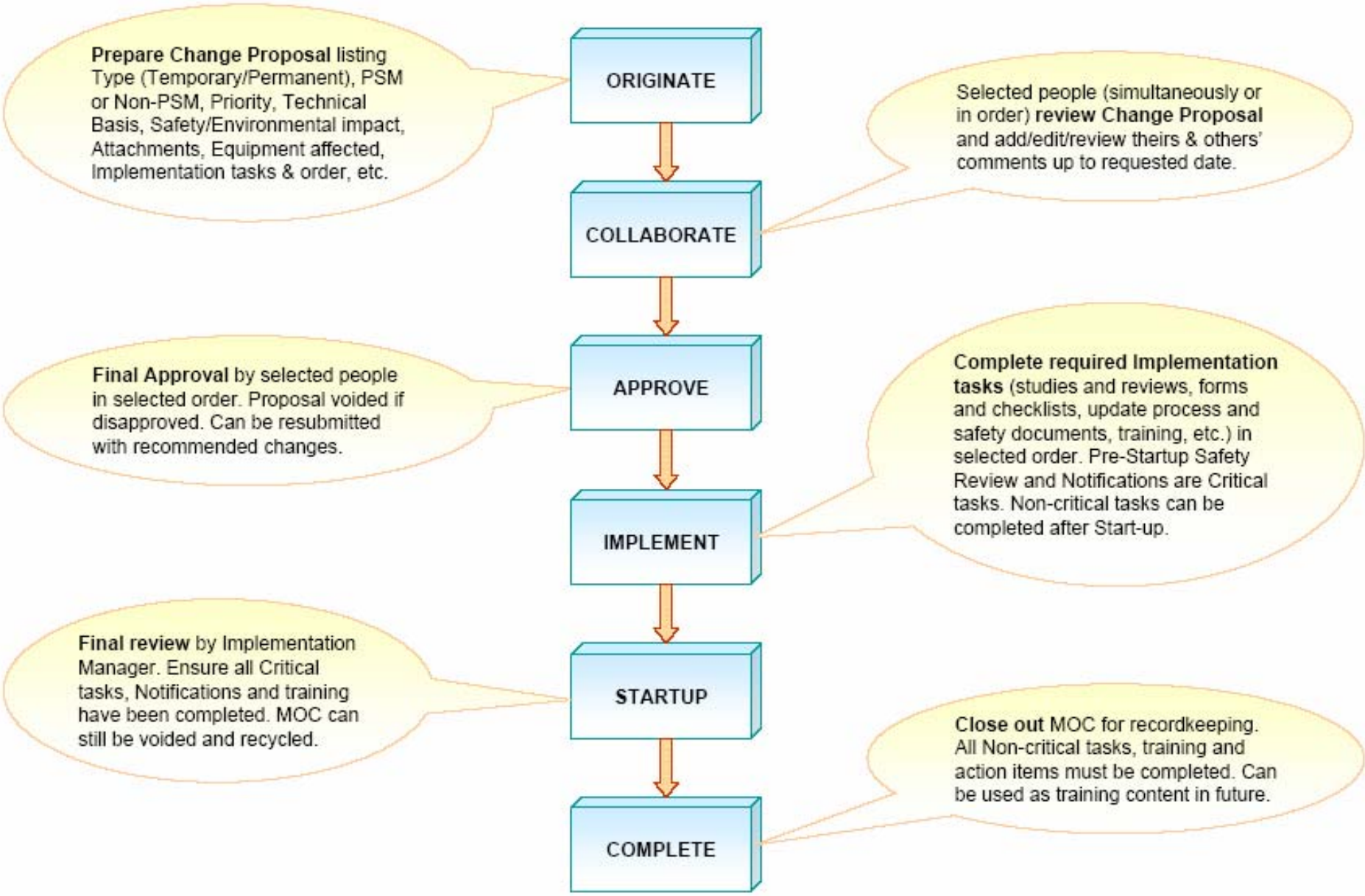
Management of Change
Facility Changes

- Emergency back-up systems
- Power supply system
- Plant security
- Fire detection and prevention system
- Adjacent processes/equipment
- Plant utilities and construction offices
- Traffic patterns, speed limits and egress routes

Management of Change
Evaluate beforehand

- Technical basis for the proposed change
- Impact on safety and health
- Impact on operating procedures
- Time period for the change
- Authorization requirements for the proposed change
- All affected employees informed of and trained in the change prior to start-up
- Updated process safety information

MANAGEMENT OF CHANGE (MOC) PROCESS



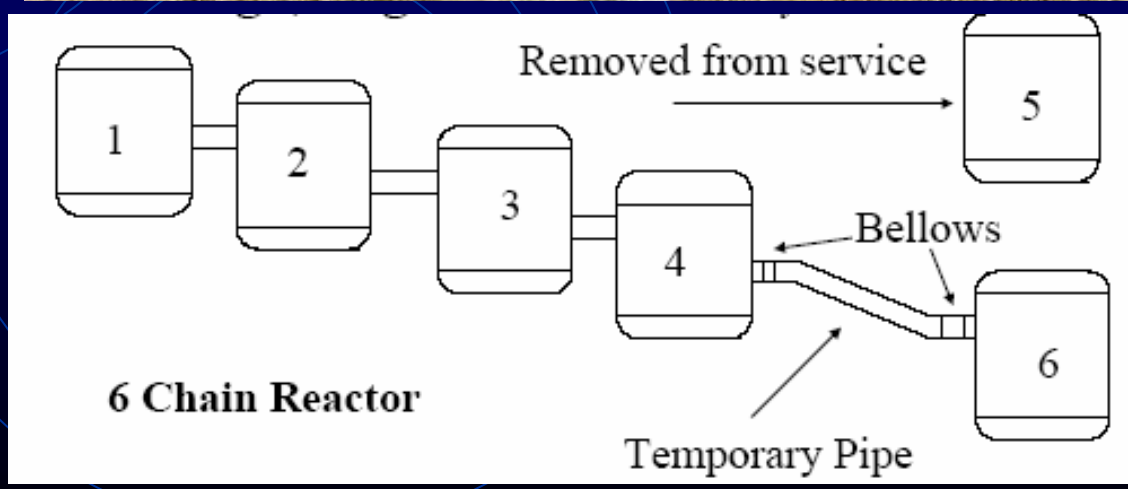
Management of Change Importance Flixborough, England 6-1-74

40 tons of volatized product released & ignited

- Substandard bypass installed w/out safety review
  - No pressure testing
  - Pipe supports not adequate for over flexing
- Excessive inventories of cyclohexane

Flixborough, England 6-1-74

- 6 gravity fed reactors
  - 20 tons each
- Reactor 5 removed due to structural crack
- Reactors 4 & 6 connected via 20” pipe & flexible connecting bellows
  - 28” spec pipe not in stock



Management of Change Importance BP Texas City 3-23-05

- Distillation tower flooded w/ hydrocarbons causing release from vent stack & explosion during restart
- 15 killed, 180 injured

Management of Change Importance BP Texas City 3-23-05

- No MOC for trailer placement next to isomerization unit.
- No MOC when operators set alarm set points
- No MOC for raffinate startup allowed although pressure control valve wasn't operable.
- No MOC training for previous 2 yrs although significant personnel turnover
- No MOC for change to prestartup operating procedures

Management of Change Importance Martinez, CA 2-23-99

- No MOC when piping & valves were replaced on oil fractionator
- Process continued and naptha ignited - killing 4
- Shut-off valves malfunctioned & drain valves were clogged
- No MOC for operational changes to the desalter beyond design specs that created corrosive conditions

Pre-startup Safety Review

- For new facilities
- For modified facilities where a change is needed to the process safety information

Pre-startup Safety Review Evaluate beforehand

- Construction & equipment is in accordance w/ design specs
- Safety, operating, maintenance, & emergency procedures are in place & adequate
- PHA has been performed and recommendations resolved for new facilities
- Modified facilities meet the requirements contained in MOC
- Training has been completed for employees involved in operating the new process

References

- API – Management of Process Hazards, Recommend Practice 750
- ORC – Recommendations for Process Hazards Management of Substances with Catastrophic Potential
- AICHE – Center for Chemical Process Safety
  - Guidelines for Technical Management of Chemical Process Safety
  - Guidelines for Auditing Process Safety Management Systems
- CMA –
  - Managing Process Changes, A managers' guide to implementing & improving management of change systems
  - Responsible Care Initiative – Process safety code of management practices; Management Practice #10